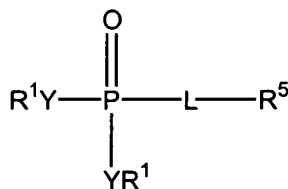
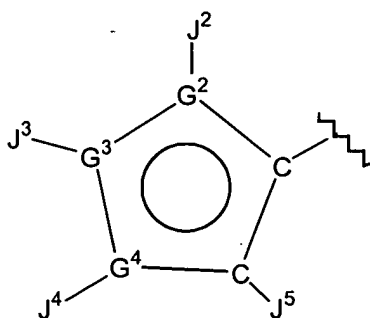


1. A compound of formula (I):



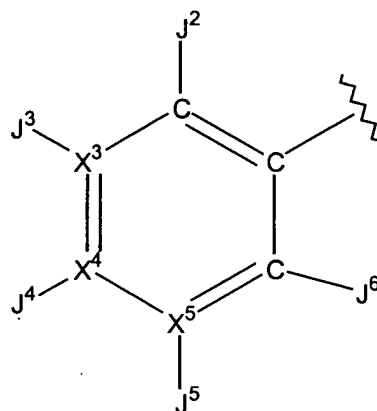
(I)

wherein R<sup>5</sup> is selected from the group consisting of:



I (a)

and



I (b)

wherein:

G<sup>2</sup> is selected from the group consisting of C, O, and S;

G<sup>3</sup> and G<sup>4</sup> are independently selected from the group consisting of C, N, O, and S;

wherein a) not more than one of G<sup>2</sup>, G<sup>3</sup>, and G<sup>4</sup> may be O, or S; b) when G<sup>2</sup> is O or S, not more than one of G<sup>3</sup> and G<sup>4</sup> is N; c) at least one of G<sup>2</sup>, G<sup>3</sup>, and G<sup>4</sup> is C; and d) G<sup>2</sup>, G<sup>3</sup>, and G<sup>4</sup> are not all C;

X<sup>3</sup>, X<sup>4</sup>, and X<sup>5</sup> are independently selected from the group consisting of C and N, wherein no more than two of X<sup>3</sup>, X<sup>4</sup>, and X<sup>5</sup> may be N;

J<sup>2</sup>, J<sup>3</sup>, J<sup>4</sup>, J<sup>5</sup>, and J<sup>6</sup> are independently selected from the group consisting of -H, -NR<sup>4</sup><sub>2</sub>, -CONR<sup>4</sup><sub>2</sub>, -CO<sub>2</sub>R<sup>3</sup>, halo, -S(O)<sub>2</sub>NR<sup>4</sup><sub>2</sub>, -S(O)R<sup>3</sup>, -SO<sub>2</sub>R<sup>3</sup>, alkyl, alkenyl, alkynyl, alkylenearyl, perhaloalkyl, haloalkyl, aryl, heteroaryl, alkylene-OH, -C(O)R<sup>11</sup>, -OR<sup>11</sup>, -alkylene-NR<sup>4</sup><sub>2</sub>, -alkylene-CN, -CN, -C(S)NR<sup>4</sup><sub>2</sub>, -OR<sup>2</sup>, -SR<sup>2</sup>, -N<sub>3</sub>, -NO<sub>2</sub>, -NHC(S)NR<sup>4</sup><sub>2</sub>, and -NR<sup>18</sup>COR<sup>2</sup>;

L is selected from the group consisting of:

B<sup>3</sup>  
 i) a linking group having 2-4 atoms measured by the fewest number of atoms connecting the carbon of the aromatic ring and the phosphorus atom and is selected from the group consisting of -furanyl-, -thienyl-, -pyridyl-, -oxazolyl-, -imidazolyl-, -phenyl-, -pyrimidinyl-, -pyrazinyl-, and -alkynyl-, all of which may be optionally substituted; and

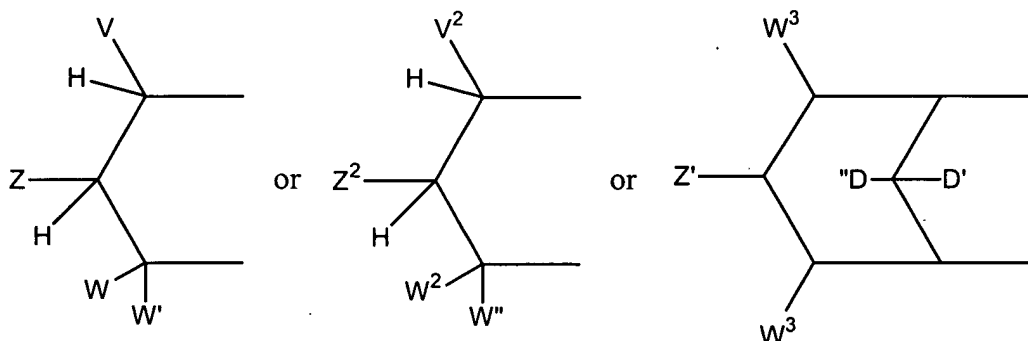
ii) a linking group having 3-4 atoms measured by the fewest number of atoms connecting the carbon of the aromatic ring and the phosphorus atom and is selected from the group consisting of -alkylenecarbonylamino-, -alkyleneaminocarbonyl-, -alkyleneoxycarbonyl-, -alkyleneoxy-, and -alkyleneoxyalkylene-, all of which may be optionally substituted;

Y is independently selected from the group consisting of -O-, and -NR<sup>6</sup>-;

when Y is -O-, then R<sup>1</sup> attached to -O- is independently selected from the group consisting of -H, alkyl, optionally substituted aryl, optionally substituted alicyclic where the cyclic moiety contains a carbonate or thiocarbonate, optionally substituted arylalkylene-, -C(R<sup>2</sup>)<sub>2</sub>OC(O)NR<sup>2</sup><sub>2</sub>, -NR<sup>2</sup>-C(O)-R<sup>3</sup>, -C(R<sup>2</sup>)<sub>2</sub>-OC(O)R<sup>3</sup>, -C(R<sup>2</sup>)<sub>2</sub>-O-C(O)OR<sup>3</sup>, -C(R<sup>2</sup>)<sub>2</sub>OC(O)SR<sup>3</sup>, -alkylene-S-C(O)R<sup>3</sup>, -alkylene-S-S-alkylenehydroxy, and -alkylene-S-S-S-alkylenehydroxy,

when one Y is -NR<sup>6</sup>-, and R<sup>1</sup> attached to it is -(CR<sup>12</sup>R<sup>13</sup>)<sub>n</sub>-C(O)-R<sup>14</sup>, then the other YR<sup>1</sup> is selected from the group consisting of -NR<sup>15</sup>R<sup>16</sup>, -OR<sup>7</sup>, and NR<sup>6</sup>-(CR<sup>12</sup>R<sup>13</sup>)<sub>n</sub>-C(O)-R<sup>14</sup>;

or when either Y is independently selected from -O- and -NR<sup>6</sup>-, then together R<sup>1</sup> and R<sup>1</sup> are -alkylene-S-S-alkylene- to form a cyclic group, or together R<sup>1</sup> and R<sup>1</sup> are



wherein

a) V is selected from the group of aryl, substituted aryl, heteroaryl, substituted heteroaryl, 1-alkynyl and 1-alkenyl;

B<sup>3</sup>  
Z is selected from the group of  $-\text{CHR}^2\text{OH}$ ,  $-\text{CHR}^2\text{OC}(\text{O})\text{R}^3$ ,  $-\text{CHR}^2\text{OC}(\text{S})\text{R}^3$ ,  $-\text{CHR}^2\text{OC}(\text{S})\text{OR}^3$ ,  $-\text{CHR}^2\text{OC}(\text{O})\text{SR}^3$ ,  $-\text{CHR}^2\text{OCO}_2\text{R}^3$ ,  $-\text{OR}^2$ ,  $-\text{SR}^2$ ,  $-\text{CHR}^2\text{N}_3$ ,  $-\text{CH}_2\text{aryl}$ ,  $-\text{CH}(\text{aryl})\text{OH}$ ,  $-\text{CH}(\text{CH}=\text{CR}^2_2)\text{OH}$ ,  $-\text{CH}(\text{C}\equiv\text{CR}^2)\text{OH}$ ,  $-\text{R}^2$ ,  $-\text{NR}^2_2$ ,  $-\text{OCOR}^3$ ,  $-\text{OCO}_2\text{R}^3$ ,  $-\text{SCOR}^3$ ,  $-\text{SCO}_2\text{R}^3$ ,  $-\text{NHCOR}^2$ ,  $-\text{NHCO}_2\text{R}^3$ ,  $-\text{CH}_2\text{NHaryl}$ ,  $-(\text{CH}_2)_p-\text{OR}^{19}$ , and  $-(\text{CH}_2)_p-\text{SR}^{19}$ ; or

together V and Z are connected via an additional 3-5 atoms to form a cyclic group, optionally containing 1 heteroatom, said cyclic group is fused to an aryl group at the beta and gamma position to the Y adjacent to V; or

together Z and W are connected via an additional 3-5 atoms to form a cyclic group, optionally containing one heteroatom, and V must be aryl, substituted aryl, heteroaryl, or substituted heteroaryl; or

W and W' are independently selected from the group of -H, alkyl, aralkyl, alicyclic, aryl, substituted aryl, heteroaryl, substituted heteroaryl, 1-alkenyl and 1-alkynyl and  $-\text{R}^9$ ; or

together W and W' are connected via an additional 2-5 atoms to form a cyclic group, optionally containing 0-2 heteroatoms, and V must be aryl, substituted aryl, heteroaryl, or substituted heteroaryl;

b)  $\text{V}^2$ ,  $\text{W}^2$  and  $\text{W}''$  are independently selected from the group of -H, alkyl, aralkyl, alicyclic, aryl, substituted aryl, heteroaryl, substituted heteroaryl, 1-alkenyl, and 1-alkynyl;

$\text{Z}^2$  is selected from the group of  $-\text{CHR}^2\text{OH}$ ,  $-\text{CHR}^2\text{OC}(\text{O})\text{R}^3$ ,  $-\text{CHR}^2\text{OC}(\text{S})\text{R}^3$ ,  $-\text{CHR}^2\text{OCO}_2\text{R}^3$ ,  $-\text{CHR}^2\text{OC}(\text{O})\text{SR}^3$ ,  $-\text{CHR}^2\text{OC}(\text{S})\text{OR}^3$ ,  $-\text{CH}(\text{aryl})\text{OH}$ ,  $-\text{CH}(\text{CH}=\text{CR}^2_2)\text{OH}$ ,  $-\text{CH}(\text{C}\equiv\text{CR}^2)\text{OH}$ ,  $-\text{SR}^2$ ,  $-\text{CH}_2\text{NHaryl}$ ,  $-\text{CH}_2\text{aryl}$ ; or

together  $\text{V}^2$  and  $\text{Z}^2$  are connected via an additional 3-5 atoms to form a cyclic group containing 5-7 ring atoms, optionally containing 1 heteroatom, and substituted with hydroxy, acyloxy, alkyleneoxycarbonyloxy, or aryloxy carbonyloxy attached to a carbon atom that is three atoms from a Y attached to phosphorus;

c)  $\text{Z}'$  is selected from the group of  $-\text{OH}$ ,  $-\text{OC}(\text{O})\text{R}^3$ ,  $-\text{OCO}_2\text{R}^3$ , and  $-\text{OC}(\text{O})\text{SR}^3$ ;

$\text{D}'$  is -H;

$\text{D}''$  is selected from the group of -H, alkyl,  $-\text{OR}^2$ ,  $-\text{OH}$ , and  $-\text{OC}(\text{O})\text{R}^3$ ;

each  $W^3$  is independently selected from the group consisting of -H, alkyl, aralkyl, alicyclic, aryl, substituted aryl, heteroaryl, substituted heteroaryl, 1-alkenyl, and 1-alkynyl;

p is an integer 2 or 3;

with the provisos that:

a) V, Z, W, W' are not all -H and  $V^2$ ,  $Z^2$ ,  $W^2$ , W'' are not all -H; and

$R^2$  is selected from the group consisting of  $R^3$  and -H;

$R^3$  is selected from the group consisting of alkyl, aryl, alicyclic, and aralkyl;

each  $R^4$  is independently selected from the group consisting of -H, alkylene, -alkylenearyl and aryl, or together  $R^4$  and  $R^4$  are connected via 2-6 atoms, optionally including one heteroatom selected from the group consisting of O, N, and S;

$R^6$  is selected from the group consisting of -H, lower alkyl, acyloxyalkyl, aryl, aralkyl, alkyloxycarbonyloxyalkyl, and lower acyl, or together with  $R^{12}$  is connected via 1-4 carbon atoms to form a cyclic group;

$R^7$  is lower  $R^3$ ;

each  $R^9$  is independently selected from the group consisting of -H, alkyl, aralkyl, and alicyclic, or together  $R^9$  and  $R^9$  form a cyclic alkyl group;

$R^{11}$  is selected from the group consisting of alkyl, aryl,  $-NR^2_2$ , and  $-OR^2$ ; and

each  $R^{12}$  and  $R^{13}$  is independently selected from the group consisting of H, lower alkyl, lower aryl, lower aralkyl, all optionally substituted, or  $R^{12}$  and  $R^{13}$  together are connected via a chain of 2-6 atoms, optionally including 1 heteroatom selected from the group consisting of O, N, and S, to form a cyclic group;

each  $R^{14}$  is independently selected from the group consisting of  $-OR^{17}$ ,  $-N(R^{17})_2$ ,  $-NHR^{17}$ ,  $-SR^{17}$ , and  $-NR^2OR^{20}$ ;

$R^{15}$  is selected from the group consisting of -H, lower aralkyl, lower aryl, lower aralkyl, or together with  $R^{16}$  is connected via 2-6 atoms, optionally including 1 heteroatom selected from the group consisting of O, N, and S;

$R^{16}$  is selected from the group consisting of  $-(CR^{12}R^{13})_n-C(O)-R^{14}$ , -H, lower alkyl, lower aryl, lower aralkyl, or together with  $R^{15}$  is connected via 2-6 atoms, optionally including 1 heteroatom selected from the group consisting of O, N, and S;

B<sup>3</sup> each R<sup>17</sup> is independently selected from the group consisting of lower alkyl, lower aryl, and lower aralkyl, or together R<sup>17</sup> and R<sup>17</sup> on N is connected via 2-6 atoms, optionally including 1 heteroatom selected from the group consisting of O, N, and S;

R<sup>18</sup> is selected from the group consisting of -H and lower R<sup>3</sup>;

R<sup>19</sup> is selected from the group consisting of -H, and lower acyl;

R<sup>20</sup> is selected from the group consisting of -H, lower R<sup>3</sup>, and -C(O)-(lower R<sup>3</sup>);

n is an integer from 1 to 3;

with the provisos that:

- 1) when X<sup>3</sup>, X<sup>4</sup>, or X<sup>5</sup> is N, then the respective J<sup>3</sup>, J<sup>4</sup>, or J<sup>5</sup> is null;
  - 2) when L is substituted furanyl, then at least one of J<sup>2</sup>, J<sup>3</sup>, J<sup>4</sup>, and J<sup>5</sup> is not -H or null;
  - 3) when L is not substituted furanyl, then at least two of J<sup>2</sup>, J<sup>3</sup>, J<sup>4</sup>, and J<sup>5</sup> on formula I(a) or J<sup>2</sup>, J<sup>3</sup>, J<sup>4</sup>, J<sup>5</sup>, and J<sup>6</sup> on formula I(b) are not -H or null;
  - 4) when G<sup>2</sup>, G<sup>3</sup>, or G<sup>4</sup> is O or S, then the respective J<sup>2</sup>, J<sup>3</sup>, or J<sup>4</sup> is null;
  - 5) when G<sup>3</sup> or G<sup>4</sup> is N, then the respective J<sup>3</sup> or J<sup>4</sup> is not halogen or a group directly bonded to G<sup>3</sup> or G<sup>4</sup> via a heteroatom;
  - 6) if both Y groups are -NR<sup>6</sup>-, and R<sup>1</sup> and R<sup>1</sup> are not connected to form a cyclic phosphoramidate, then at least one R<sup>1</sup> is -(CR<sup>12</sup>R<sup>13</sup>)<sub>n</sub>-C(O)-R<sup>14</sup>;
  - 7) when L is -alkylenecarbonylamino- or -alkyleneaminocarbonyl-, then X<sup>3</sup>, X<sup>4</sup>, and X<sup>5</sup> are not all C;
  - 8) when L is -alkeneoxyalkylene-, and X<sup>3</sup>, X<sup>4</sup>, and X<sup>5</sup> are all C, then neither J<sup>3</sup> nor J<sup>5</sup> can be substituted with an acylated amine;
  - 9) when R<sup>5</sup> is substituted phenyl, then J<sup>3</sup>, J<sup>4</sup>, and J<sup>5</sup> is not purinyl, purinylalkylene, deazapurinyl, or deazapurinylalkylene;
  - 10) R<sup>1</sup> can be selected from the lower alkyl only when the other YR<sup>1</sup> is -NR<sup>6</sup>-C(R<sup>12</sup>R<sup>13</sup>)<sub>n</sub>-C(O)-R<sup>14</sup>;
  - 11) when R<sup>5</sup> is substituted phenyl and L is 1,2-ethynyl, then J<sup>3</sup> or J<sup>5</sup> is not a heterocyclic group;
  - 12) when L is 1,2-ethynyl, then X<sup>3</sup> or X<sup>5</sup> cannot be N;
- and pharmaceutically acceptable prodrugs and salts thereof;
- 13) when R<sup>5</sup> is substituted phenyl and L is -alkyleneoxycarbonyl-, then J<sup>3</sup> or J<sup>5</sup> is not O-aryl;